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Data Sources and Methods for the Sustainability of Timber Harvest Indicator

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1 Introduction

The Sustainability of Timber Harvest indicator (http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=A132BB91-1) is a part of the Canadian Environmental Sustainability Indicators (CESI) program (http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=47F48106-1), which provides data and information to track Canada's performance on key environmental sustainability issues. This indicator is also used to measure progress towards the goals and targets of the Federal Sustainable Development Strategy (http://www.ec.gc.ca/dd-sd/default.asp?lang=En&n=CD30F295-1).

2 Description and rationale of the Sustainability of Timber Harvest indicator

2.1 Description

This indicator compares the amount of timber harvested with the estimated national wood supply. **Wood supply** is the volume of timber that can be harvested from an area over a specified period of time while meeting environmental, economic and social objectives. Wood supply is for industrial roundwood supplies only and does not include other types of harvest. **Industrial roundwood** refers to harvested trees that are intended to be delivered to mills. Other types of roundwood include fuelwood (used for industrial or institutional energy) and firewood (used for household or recreational energy). Under sustainable forest management, forest managers plan for harvest levels that will not impact the long-term sustainability of the forest resource.

The estimation of wood supply is affected by many factors.[1] Wood supply levels are estimated for those forests that are actively managed for timber, which is a subset of forests and other wooded land. **Forest land** is defined as an "area of land where tree canopies cover more than 10% of the total area, and the trees, when mature, can grow to a height of more than 5 metres. It does not include land that is predominantly urban or used for agricultural purposes."[2] **Other wooded land** is defined as an "area of land where 1) tree canopies cover 5-10% of the total area and the trees, when mature, can grow to a height above 5 metres; or 2) shrubs, bushes and trees together cover more than 10% of the area. These areas include treed wetlands (swamps) and land with slow-growing and scattered trees. They do not include land that is predominantly agricultural or urban."[2]

2.2 Rationale

Canada is committed to sustainable forest management, which is defined as "management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations."[3] The Sustainability of Timber Harvest indicator is one measure of the success of Canada's forest stewardship.

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[1] Canadian Council of Forest Ministers (2012) National Forestry Database, Wood Supply - Background. Retrieved on 11 August, 2013. Available from: http://nfdp.ccfm.org/supply/background_e.php.
[2] Natural Resources Canada (2012) The State of Canada's Forests Annual Report 2012. Retrieved on 11 August, 2013. Available from: http://cfs.nrcan.gc.ca/publications?id=34055.
[3] Natural Resources Canada (2012) Glossary. Retrieved on 11 August, 2013. Available from: http://cfs.nrcan.gc.ca/terms/browse/S.

2.3 Recent changes to the indicator

Reported harvest rates now include industrial roundwood harvests only, to better align with wood supply estimates. Previous reports used total roundwood harvests. Information on total roundwood harvests is maintained as supplementary information in the data table. Other reports may cite industrial roundwood harvests or total roundwood harvests, and care should be taken in making comparisons.

Minor adjustments to previous years' data continue to be made as source data are revised and updated.

3 Data

3.1 Data source

Wood supply and harvest estimates are drawn from the National Forestry Database (NFD) (http://nfdp.ccfm.org/index_e.php), maintained by the Canadian Forest Service of Natural Resources Canada. The data contained in the NFD are provided by provincial and territorial resource management organizations[4] and federal government departments.

Canada's total area is estimated using the Atlas of Canada 1,000,000 National Frameworks Data, Administrative Boundaries (http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/0d2b6f01-fe48-521f-aa7c-a177613c56dd.html). World forest area is drawn from the State of the World's Forests 2012 (http://www.fao.org/docrep/016/i3010e/i3010e00.htm).

3.2 Spatial coverage

The indicator includes all provinces and territories, with the exception of Nunavut, which is not a National Forestry Database partner.

3.3 Temporal coverage

Annual estimates from 1990 to 2011 are included.

3.4 Data completeness

Data are updated in the National Forestry Database on a biannual basis, and include all estimates as provided by reporting jurisdictions.

3.5 Data timeliness

The National Forestry Database is updated biannually, with a 14-month time lag for the first update each year. For example, data for 2011 were collected in 2012 and preliminary totals were published in February 2013. Updates and corrections to the data are captured, and final data were published in June 2013. This indicator is current to the end of 2011.

[4] Canadian Council of Forest Ministers, National Forestry Database (2013) Partners. Retrieved on 11 August, 2013. Available from: http://nfdp.ccfm.org/nfd_partners_e.php.

4 Methods

The Sustainability of Timber Harvest indicator compares wood supply to industrial roundwood harvest.

Wood supply, the volume of timber that may be sustainably harvested, is estimated for each province and territory. Provincial and territorial wood supplies are summed to estimate Canada's wood supply.

Each provincial or territorial contribution to wood supply is the sum of two values:

1. **The estimated Annual Allowable Cuts** (AACs, known as Allowable Annual Cut in British Columbia) **for provincial Crown lands**, i.e., publicly owned lands under provincial jurisdiction.

This is the volume of industrial roundwood, as estimated by professional foresters, which may be harvested each year from provincial Crown lands. Provincial Crown lands make up 77% of Canada's forest and other wooded land, but the proportion varies by province (details on forest ownership by province can be found in The State of Canada's Forests Annual Report 2011 [http://cfs.nrcan.gc.ca/publications?id=32683]). Most provinces establish AAC levels for their Crown lands based on a policy of maintaining a non-declining future wood supply and considering a range of additional factors. For example, AAC levels may be decreased in order to maintain animal habitat or increased to permit salvage of insect-damaged wood. The importance of individual factors to the AAC varies among provinces and even among forest management areas within provinces, due to regional differences in forestry policies. The extensive rationale behind an AAC determination for an individual forest management area falls under provincial jurisdiction; additional information may be obtained from provincial resource management organizations.[5] The volume of wood harvested may be above or below the AAC in any one year, but needs to balance out over the regulation period. AACs are set based on an assessment of a wide range of ecological, social and economic factors, and are therefore only a proxy for the sustainable level of harvest.

and

2. **Estimates of wood supply on federal, territorial and private lands**

Federal, territorial and private lands account for 2%, 14% and 7%, respectively, of Canada's forest and other wooded land. Wood supply estimates are based on sustainable management plans (when available) or on past harvest levels. Estimation methods are not standardized and may or may not be similar to those used for the AAC.

Because historical harvests are often used to estimate wood supply, recent declines in harvest levels have led to a decreased estimate of wood supply in some jurisdictions. This does not necessarily imply a change in forest health or harvest sustainability.

The 2011 ownership breakdown of wood supply by province and territory is available from the National Forestry Database.[6]

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[5] Canadian Council of Forest Ministers (2013) National Forestry Database, Partners. Retrieved on 11 August, 2013. Available from: http://nfdp.ccfm.org/nfd_partners_e.php.

[6] Canadian Council of Forest Ministers (2013) National Forestry Database, Wood Supply - Jurisdictional Tables. Retrieved on 11 August, 2013. Available from: http://nfdp.ccfm.org/supply/jurisdictional_e.php.

Industrial roundwood harvest volumes refer to roundwood (http://nfdp.ccfm.org/glossary_e.php#products), which includes sections of tree stems (with or without bark), logs, bolts, pulpwood, posts and pilings. Industrial fuelwood and household firewood are not included as part of the industrial roundwood harvest, although they contribute to the total roundwood harvest. Other forest products such as Christmas trees are not included.

Canada's total industrial roundwood harvest is an aggregate of the following:

1. **The reported industrial roundwood harvested from provincial Crown lands**

Provincial laws require harvest from such lands to be reported and compared to the AAC value for individual forest management areas. Although the harvest must not exceed the AAC over multi-year regulation periods, a deviation by as much as 50% may be allowed in a given year. Regulation periods are 5 to 10 years in most cases.

and

2. **The industrial roundwood harvested from federal, territorial and private lands**

Because there is generally no legislated mechanism to report harvest on these lands, these volumes are estimated by either provincial or federal forest authorities located in that jurisdiction. Harvest from such lands is unregulated, meaning that harvesters are not required by law to compare their harvest to a sustainable level.

The proportion of global forest area in Canada is calculated by dividing the total area of Canada's forests, other wooded land, and other land with tree cover by the world forest area.

5 Caveats and limitations

- In some cases, figures are either unavailable or too small to be expressed or included in the national aggregate values. Detailed caveats on the quality or completeness of annual data from individual provinces and territories, including explicit indications of which data are estimates, can be found by generating customized reports from the NFD (http://nfdp.ccfm.org/dynamic_report/dynamic_report_ui_e.php). Supply and harvest can be viewed by year, wood type (hardwood/softwood) and by land jurisdiction (provincial, private, federal and territorial) using this database.

- National aggregation can mask harvests above or below the AAC in individual provinces. Similarly, the provincial aggregates can mask variability among management areas. If harvest above the AAC occurs in a portion of a regulation period, it may be balanced elsewhere such that the overall AAC of the regulation period is not exceeded.

- As noted in the Methods section, AACs are only a rough approximation of wood supply on Crown lands, as forest management agencies consider many policy factors beyond the ecological sustainability of the forest when they set the level of allowable harvest.

- A large percentage of forest land in Atlantic Canada is privately owned. According to the State of Canada's Forests 2011 (http://cfs.nrcan.gc.ca/publications?id=32683), forest land is 50% private in New Brunswick, while it is 68% private in Nova Scotia and 91% private in Prince Edward Island. In Newfoundland and Labrador, forest land is 99% provincially owned, but 69% of the timber rights on this land are leased on 99-year

leases to pulp and paper companies, and so it is treated as private property. Because of the high percentage of private lands in Atlantic Canada, provincial agencies that determine AACs also must assess the potential timber supply on private lands. The assumed percent of private forest available for harvest differs by province. In New Brunswick, for example, 100% of private woodlots are considered available for timber supply, while in Nova Scotia only 60% are assumed available for harvesting. Because private woodlots are unregulated, there is uncertainty associated with this portion of the wood supply equation. As the Atlantic region only accounts for about 4% of Canada's total AAC, the uncertainty is moderate.

- Wood supply estimates for private lands are often based solely on the average of actual past harvests, which are generally unregulated. Although estimates are provided, it is difficult to be certain whether harvest is sustainable for these lands.

- The Canadian Environmental Sustainability Indicators program uses the total area of Canada (land and water) to calculate the proportion of the country covered by forest and other wooded land. Figures in the *State of Canada's Forests* and the National Forestry Database include "other land with tree cover" and exclude uninventoried areas. The proportion of Canada's land area covered by forest, other wooded land and other land with tree cover is more than 43%.

6 References and further reading

6.1 References

Canadian Council of Forest Ministers (2013) National Forestry Database. Retrieved on 11 August, 2013. Available from: http://nfdp.ccfm.org/index_e.php.

Natural Resources Canada (2012) The State of Canada's Forests Annual Report 2012. Retrieved on 11 August, 2013. Available from: http://cfs.nrcan.gc.ca/publications?id=34055.

Natural Resources Canada (2011) The State of Canada's Forests Annual Report 2011. Retrieved on 11 August, 2013. Available from: http://cfs.nrcan.gc.ca/publications?id=32683.

6.2 Further reading

Canada's National Forest Inventory (undated) Retrieved on 11 August, 2013. Available from: https://nfi.nfis.org/home.php?lang=en.

Canadian Council of Forest Ministers (2013) Sustainable Forest Management in Canada. Retrieved on 11 August, 2013. Available from: http://www.sfmcanada.org/en/?tID=8.

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